

17. The method of claim 15, further comprising determining whether the one or more sensed cardiac complex parameter values are within one or more ranges of normal values prior to comparing the one or more sensed cardiac complex parameter values to the one or more predetermined value ranges, wherein the one or more sensed cardiac complex parameter values are compared upon determining that the one or more sensed cardiac complex parameter values are within the one or more ranges of normal values.

18. The method of claim 17, further comprising:

upon determining that the one or more sensed cardiac complex parameter values are not within the one or more ranges of normal values, determining whether a maximum number of attempts has been made to evaluate the one or more sensed cardiac complex parameter values; and

upon determining that the maximum number of attempts has been made, retaining the NSR template.

19. The method of claim 15, further comprising waiting a selected time period before comparing the one or more sensed cardiac complex parameter values to one or more predetermined value ranges and determining whether the one or more sensed cardiac complex parameter values and the one or more predetermined value ranges have differences greater than a threshold.

20. The method of claim 19, wherein comparing one or more sensed cardiac complex parameter values to one or more predetermined value ranges and determining whether the one or more sensed cardiac complex parameter values and the one or more predetermined value ranges have differences greater than a threshold are automatically performed after the selected time period.

21. The method of claim 15, wherein comparing one or more sensed cardiac complex parameter values and determining whether the one or more sensed cardiac complex parameter values and the one or more predetermined value ranges have differences greater than a threshold are performed after receiving a physician-initiated command.

22. The method of claim 15, wherein comparing one or more sensed cardiac complex parameter values to one or more predetermined value ranges includes comparing one or more sensed cardiac complex parameter values to one or more physician-programmed value ranges.

B1  
23. The method of claim 15, wherein comparing one or more sensed cardiac complex parameter values to one or more predetermined value ranges includes comparing one or more sensed cardiac complex parameter values to one or more value ranges derived from a current NSR template.

24. The method of claim 15, further comprising creating an initial NSR template which is updated when the sensed cardiac complex parameter values have differences that are greater than the threshold.

25. The method of claim 24, wherein creating an initial NSR template includes:  
determining whether one or more sensed cardiac complex parameter values are within one or more ranges of normal parameter values; and  
setting the initial NSR template based on the one or more sensed cardiac complex parameter values.

26. The method of claim 25, further comprising displaying a proposed NSR template, and determining whether the proposed NSR template is approved prior to setting the initial NSR template.

27. The method of claim 25, further comprising:

upon determining that the one or more sensed cardiac complex parameter values are not within one or more ranges of normal parameter values, determining whether a maximum number of attempts has been made to evaluate the one or more sensed cardiac complex parameter values; and

upon determining that a maximum number of attempts has been made, redefining one or more ranges of acceptable parameter values.

28. The method of claim 15, wherein updating a NSR template comprises setting an updated NSR template based on the sensed cardiac complex parameter values.

29. The method of claim 28, further comprising displaying a proposed NSR template, and determining whether the proposed NSR template is approved prior to setting the updated NSR template.

30. A method, comprising:

creating a normal sinus rhythm (NSR) template;

determining whether sensed cardiac complex parameter values are within a range of normal values;

upon determining that the sensed cardiac complex parameter values are within a range of normal values, comparing the sensed cardiac complex parameter values to predetermined value ranges;

determining whether the sensed cardiac complex parameter values and the predetermined value ranges have differences greater than a threshold; and

updating the NSR template upon determining that the sensed cardiac complex parameter values and the predetermined value ranges have differences that are greater than the threshold.

31. The method of claim 30, further comprising:

upon determining that the sensed cardiac complex parameter values are not within a range of normal values, determining whether a maximum number of attempts has been made to evaluate the sensed cardiac complex parameter values; and

upon determining that the maximum number of attempts has been made, retaining the NSR template.

32. The method of claim 30, further comprising waiting a selected time period before comparing sensed cardiac complex parameter values to predetermined value ranges and determining whether the sensed cardiac complex parameter values and the predetermined value ranges have differences greater than a threshold.

B1  
33. The method of claim 32, wherein comparing sensed cardiac complex parameter values to predetermined value ranges and determining whether the sensed cardiac complex parameter values and the predetermined value ranges have differences greater than a threshold are automatically performed after the selected time period.

34. The method of claim 32, wherein comparing sensed cardiac complex parameter values to predetermined value ranges and determining whether the sensed cardiac complex parameter values and the predetermined value ranges have differences greater than a threshold are performed after receiving a physician-initiated command.

35. The method of claim 30, wherein creating a NSR template includes:

determining whether sensed cardiac complex parameter values are within a range of normal parameter values;

displaying a proposed NSR template based on the sensed cardiac complex parameter values;

determining whether the proposed NSR template is approved; and

setting the proposed NSR template as the NSR template.

36. The method of claim 30, wherein updating the NSR template upon determining that the sensed cardiac complex parameter values have differences that are greater than the threshold includes:

displaying a proposed updated NSR template;  
determining whether the proposed updated NSR template is approved; and  
upon determining that the proposed updated NSR template is approved, setting the proposed updated NSR template an updated NSR template.

37. The method of claim 30, wherein comparing the sensed cardiac complex parameter values to predetermined value ranges includes comparing sensed cardiac complex parameter values to physician-programmed value ranges.

B1  
38. The method of claim 30, wherein comparing the sensed cardiac complex parameter values to predetermined value ranges includes comparing sensed cardiac complex parameter values to value ranges derived from the NSR template.

39. A medical device, comprising:

a morphology analyzer adapted to extract and measure sensed cardiac complex parameter values;

a template generating circuit connected to the morphology analyzer and adapted to receive the sensed cardiac complex parameter values and generate a normal sinus rhythm (NSR) template; and

a template comparison circuit connected to the template generating circuit and adapted to compare sensed cardiac complex parameter values to predetermined cardiac parameter values,

wherein the template comparison circuit and the template generating circuit cooperate to update the NSR template based on the compared sensed cardiac complex parameter values and the predetermined cardiac parameter values.

**SUPPLEMENTAL PRELIMINARY AMENDMENT**

Serial Number: 09/921,348

Filing Date: August 2, 2001

Title: METHOD AND SYSTEM FOR VERIFYING THE INTEGRITY OF NORMAL SINUS RHYTHM TEMPLATES

Page 7

Dkt: 279.134US2

40. The medical device of claim 39, wherein the template comparison circuit and the template generating circuit are adapted to cooperate to update the NSR template when the sensed cardiac complex parameter values vary from a current NSR template by a calculated threshold value.

B1  
41. The medical device of claim 40, wherein the template comparison circuit is adapted to calculate the threshold value by multiplying parameter values for the current NSR template by a predetermined deviation percentage.

42. The medical device of claim 41, wherein the template comparison circuit is adapted to determine a number of attempts to evaluate the sensed cardiac complex parameter values.

43. The medical device of claim 42, further comprising input circuitry connected to the morphology analyzer and adapted to be connected to at least one electrode on at least one lead.

---